

ADDITIONAL NOTES ON THE ERIOCAULACEAE. LII

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PAEPALANTHUS GARIMPENSIS Alv. Silv.

Additional bibliography: Moldenke, *Phytologia* 29: 394. 1975.

The plate 162, cited in error by Silveira (1928), actually depicts P. fuscus Alv. Silv.

Citations: BRAZIL: Minas Gerais: Mendes Magalhães 2327 [Herb. Jard. Bot. Belo Horiz. 43381] (N), 2560 [Herb. Jard. Bot. Belo Horiz. 43865] (N).

PAEPALANTHUS GENICULATUS (Bong.) Kunth, Enum. Pl. 3: 521--522 & 573 [as "P. ? geniculatus"]. 1841; Körn. in Mart., Fl. Bras. 3 (1): 381. 1863.

Synonymy: Eriocaulon geniculatum Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 625. 1831. Paepalanthus geniculatus Kunth ex Körn. in Mart., Fl. Bras. 3 (1): 293 & 381. 1863. Dupatya geniculata (Bong.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Dupatya geniculata Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus paniculatus (Bong.) Kunth ex Moldenke, Résumé 327, in syn. 1959. Paepalanthus falcatus Gardn. ex Moldenke, *Phytologia* 25: 241, in syn. 1973 [not P. falcatus (Bong.) Körn., 1894, nor Körn., 1863, nor Mart., 1959].

Bibliography: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 625, [pl. 21]. 1831; Bong., Ess. Monog. Erioc. 25. 1831; Bong., Mém. Acad. Sci. St. Pétersb., ser. 6, 5 (2): 21, pl. 31. 1839; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 521, 573, 613, & 625. 1841; D. Dietr., Syn. Pl. 5: 261. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 276 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 293, 381, 507, & 508. 1863; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 (1893) and pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 4, 10, 168, 170, [283], 285, & 290. 1903; Alv. Silv., Fl. Mont. 1: 407. 1928; Stapf, Ind. Lond. 3: 90. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 12, 29, 35, & 48. 1946; Moldenke, Known Geogr. Distrib. Verbonac., [ed. 2], 84 & 209. 1949; Moldenke, *Phytologia* 4: 144. 1952; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 98, 280, 288, 327, & 487. 1959; Moldenke, Résumé Suppl. 1: 20. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 (1960) and pr. 3, 2: 402. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 190. 1969; Moldenke, Fifth Summ. 1: 162 & 481 (1971) and 2: 501, 583, & 952. 1971; Moldenke, *Phytologia* 25: 130, 131, & 241. 1973.

Illustrations: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6,

5 (2): pl. 31. 1839.

Under a strict interpretation of the present edition of the International Code, Kunth's transfer of Eriocaulon geniculatum Bong. to the genus Paepalanthus is invalid because he did so with a question-mark, indicating doubt in his own mind. However, the transfer was certainly validated by Körnicke in 1863. Bongard's illustration cited as "Tab. XXI" does not appear ever to have been published, but probably is preserved in the Leningrad library or herbarium, unless, of course, it is the same as the plate 31 later published.

The species is based on L. Riedel 1064, collected "in glareosis subhumidis Serra da Lapa", Minas Gerais, Brazil, flowering in December, and preserved in the Leningrad herbarium. Kunth (1841) says of it "Nonnisi ob affinitatem cum praecedente [P. glareosus] huc relatus". Under P. glareosus he says "Sequenti affinis, distinctus statura humilliore, foliis radicalibus vagina brevioribus, patenti-diffusis et capitulorum bracteis exterioribus ovato-acutis, quae valde obtusae in P. geniculato."

Bongard's original (1831) description is "subacaule; foliis radicalibus linearibus obtusiusculis pilosis ciliatis; cauliculis subhorizontalibus foliosis; pedunculis adpresse pilosis; vaginis bifidis villosis".

Ruhland (1903) cites only the original collection and comments "Cum specie praecedente [P. glareosus] valde affinis, sed jam pedunculorum indumento et bracteis involucrantibus exterioribus, obtusis bene ab illa differt". Silveira (1928) cites A. Silveira 341, collected in the Serra do Cipó in 1905. The specific name is sometimes written with an uppercase initial letter for no valid reason. Mrs. Chase collected the species in "sand on open summit of serra", at 1400 meters altitude.

The Paepalanthus falcatus (Bong.) Körn. and P. falcatus Körn., referred to in the synonymy above, are synonyms of P. pedunculatus (Bong.) Ruhl., while P. falcatus Mart. is a synonym of Leiothrix flavescens (Bong.) Ruhl.

Additional citations: BRAZIL: Minas Gerais: M. A. Chase 10356 (W-1495688); A. P. Duarte 7798 [Herb. Brad. 27770] (Lw); Héringer & Castellanos 5963 (B), 6099 (Z); Murça Pires & Black 51-11846 (Z), 2801 (N, Z); L. Riedel 1064 [Macbride photos 10608] (B-isotype, Br-isotype, Br-isotype, N-photo of isotype, N-photo of isotype, Ut-362-isotype, W-photo of isotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS GENTLEI Moldenke, N. Am. Fl. 19: 40-41. 1937.

Bibliography: Moldenke, N. Am. Fl. 19: 40-41. 1937; Moldenke, Phytologia 1: 333, 350, 351, 356, & 359. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 144. 1940; Moldenke, Alph. List Cit. 1: 32 & 231. 1946; Moldenke, Known Geogr. Distrib. Erioc. 4 & 48. 1946; Hill & Saliab., Ind. Kew. Suppl. 10: 158. 1947; Moldenke, Alph. List Cit. 2: 334 (1948) and 3: 777. 1949; Moldenke, Known Geogr.

Distrib. Verbenac., [ed. 2], 36 & 209. 1949; Moldenke, *Phytologia* 4: 144. 1952; Standl. & Steyerl., *Fieldiana Bot.* 24: 377-378. 1958; Moldenke, *Résumé* 43 & 487. 1959; Moldenke, *Fifth Summ.* 1: 82 (1971) and 2: 952. 1971.

The Gentle 992 isotypes cited below from the Cornell University, Lundell, and Montevideo herbaria were previously cited as duplicates in the Britton and University of Michigan herbaria from which they have been recently transferred.

Additional & emended citations: BRITISH HONDURAS: H. H. Bartlett 11874 (Ld, Mi); Gentle 992 (F-699366—isotype, It—isotype, Ld—isotype, S—isotype, Ug—isotype).

PAEPALANTHUS GIBBOSUS Alv. Silv., *Fl. Mont.* 1: 142-144, pl. 89. 1928.

Bibliography: Alv. Silv., *Fl. Mont.* 1: 142-144 & 407, pl. 89. 1928; Wangerin in Just, *Bot. Jahresber.* 57 (1): 476. 1937; A. W. Hill, *Ind. Kew. Suppl.* 9: 199. 1938; Worsdell, *Ind. Lond. Suppl.* 2: 183. 1941; Moldenke, *Known Geogr. Distrib. Erioc.* 12 & 48. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 84 & 209. 1949; Moldenke, *Résumé* 98 & 487. 1959; Moldenke, *Phytologia* 20: 355. 1970; Moldenke, *Fifth Summ.* 1: 162 (1971) and 2: 952. 1971.

Illustrations: Alv. Silv., *Fl. Mont.* 1: pl. 89. 1928.

This species was based by Silveira (1928) on A. Silveira 505, collected in April, 1908, "in campis, prope Contagem in Serra do Riacho do Vento, inter Diamantina, et Curvello", Minas Gerais, Brazil, and is deposited in the Silveira herbarium. He comments that the "Species ob sepala florum femineorum extus dense comata ab affinibus P. arenicola Alv. Silv. excepta, certe distincta".

Thus far, P. gibbosus is known only from the type collection.

PAEPALANTHUS GLABRIFOLIUS Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 139. 1903.

Bibliography: Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 125, 139, & 290. 1903; Prain, *Ind. Kew. Suppl.* 3: 126. 1908; Alv. Silv., *Fl. Mont.* 1: 181 & 407. 1928; Moldenke, *Known Geogr. Distrib. Erioc.* 12 & 48. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 84 & 209. 1949; Moldenke, *Résumé* 98 & 487. 1959; Moldenke, *Fifth Summ.* 1: 162 (1971) and 2: 952. 1971; Moldenke, *Phytologia* 25: 229. 1973.

Records of this species from Minas Gerais appear to be erroneous. Ruhland, in his original description of the species (1903), cites the type collection as from "Prov. Rio de Janeiro" and Glaziou's printed labels are so inscribed. The type locality is "auf Campos des Itatiaia, zwischen Felsen" and this locality is definitely in Rio de Janeiro. However, the type specimen in the Berlin herbarium has "Rio de Janeiro" stricken out on its label and "Minas" substituted in longhand. A letter from my good friend, Dr. G. F. J. Pabst, dated July 12, 1972, explains this as follows: "The border of the States Rio de Janeiro and Minas goes along the middle of the Serra da Mantiqueira. The Itatiaia re-

gion is in the Mantiqueira, with Pico das Agulhas Negras as the highest part. Collections are usually made in the area belonging to [the] State of Rio de Janeiro. Very, very few collections have been made on the Minas Gerais part of the Itatiaia hills. Campo de Itatiaia usually is called the high plateau better known as Planalto do Itatiaia (2400 msm), also in the State of Rio de Janeiro. The Minas Gerais part is difficult to reach and has nothing specially interesting, so seldom a botanist goes that way. It is the part you will find cited as Airuoca. Very nice Podocarpus lambertii formation can be seen there however. It is the side opposite to the ocean, thus rather drier, but it rains heavily in summer. It only does not get the constant humid sea winds. I would write without fear of error: State of Rio de Janeiro for whatever material is given from Itatiaia."

Silveira (1928) cites, in addition, A. Silveira 608, collected in the Serra do Itatiaia in 1913. Thus far, the species is known only from these two collections, and it has been collected in anthesis in November. Ruhland (1903) notes "Species P. glaucescenti et P. Erigeronti affinis".

Citations: BRAZIL: Rio de Janeiro: Glaziou 9001 [Macbride photos 10609] (B—type, N—photo of type, N—photo of type, W—photo of type, Z—isotype).

PAEPALANTHUS GLAREOSUS (Bong.) Kunth, Enum. Pl. 3: 521. 1841.

Synonymy: Eriocaulon glareosum Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 625. 1831. Paepalanthus glareosus Kunth apud Körn. in Mart., Fl. Bras. 3 (1): 292 & 299. 1863. Dupatya glareosa (Bong.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Dupatya glareosa Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Bong., Ess. Monog. Erioc. 25. 1831; Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 625 (1831), 3 (1): 555 (1835), and 3 (2): pl. 25. 1835; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 521, 573, 613, & 625. 1841; D. Dietr., Syn. Pl. 5: 261. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 276 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 292, 299, 380—381, 507, & 508. 1863; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 3, 168, 170, [283], 285, & 290. 1903; Alv. Silv., Fl. Mont. 1: 407. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 41. 1930; Stapf, Ind. Lond. 3: 90. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 12, 29, 35, & 48. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98, 280, 288, & 487. 1959; Moldenke, Résumé Suppl. 1: 20. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Moldenke, Fifth Summ. 1: 162 & 481 (1971) and 2: 501, 583, & 952. 1971.

Illustrations: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 3 (2): pl. 25. 1835.

Bongard's original (1831) description of this species is "sub-acaule; foliis radicalibus caespitosis patenti-diffusis brevissimis linearibus obtusis villosis; cauliculis subhorizontalibus foliosis; pedunculis retrorsum pubescentibus; vaginis foliis longioribus bifidis pilosis". It is based on L. Riedel 1043 from "in glareosis siccis Serra da Lapa", Minas Gerais, Brazil, and was collected in anthesis in November. Bongard comments that "Praecedenti [P. geniculatus] affine, a quo distinguendum: statura humilior; foliis radicalibus vaginis brevioribus patenti-diffusis et capitulorum squamis exterioribus ovato-acutis, quae valde obtusae in E. geniculato". Kunth (1841) repeats this same list of differences between the two species. Ruhland (1903) cites only the original collection. Silveira (1928) cites A. Silveira 494 from Serra Pouso Alto, Minas Gerais, collected in 1908.

Citations: BRAZIL: Minas Gerais: L. Riedel 1043 [Macbride photos 10610] (B— isotype, N—photo of isotype, N—photo of isotype, N—photo of isotype, Ut—363— isotype, W—photo of isotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS GLAUDESCENS Körn. in Mart., Fl. Bras. 3 (1): 391. 1863.

Synonymy: Dupatya glaucescens (Körn.) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Dupatya glaucescens Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 391 & 506. 1863; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 126, 139, 142, [283], & 290. 1903; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 12, 29, & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 98, 280, & 487. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Moldenke, Fifth Summ. 1: 162 & 481 (1971) and 2: 952. 1971; Moldenke, Phytologia 26: 482. 1973.

This species is known thus far only from the original collection made by Friedrich Sellow somewhere in eastern Brazil and deposited in the Berlin herbarium.

Citations: BRAZIL: State undetermined: Sellow s.n. [Brasilia] (B—type, Z— isotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS GLAUCOPHYLLUS Alv. Silv., Fl. Mont. 1: 23—24, pl. 8. 1928.

Synonymy: Paepalanthus glaucophyllus Alv. Silv., Fl. Mont. 1: pl. 8, sphalm. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 23—24 & 407, pl. 8. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98 & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971; Moldenke, Phytologia 25: 241. 1973.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 8. 1928.

This species is based on A. Silveira 810 from "In campis siccis et saxosis inter Itacambira et Juramento", Minas Gerais, Brazil, collected in July, 1926, and deposited in the Silveira herbarium. Silveira (1928) comments that the "Species a P. fasciculifero Alv. Silv. pilositate foliorum et bractearum involucrantium praecipue differt." It is known thus far only from the original collection.

PAEPALANTHUS GLAUCOPODUS Alv. Silv., Fl. Mont. 1: 99—100, pl. 2 & 63 bis. 1928.

Synonymy: Paepalanthus glaucopodus Alv. Silv., Fl. Mont. 1: pl. 2 & 63 bis, sphalm. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 99—100 & 407, pl. 2 & 63 bis. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98, 325, & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 583 & 952. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 2 & 63 bis. 1928.

This species is based on A. Silveira 756, collected "In campis arenosis prope Milho Verde, in Serra Geral", Minas Gerais, Brazil, in June of 1925 and is deposited in the Silveira herbarium. Thus far it is known only from the original collection.

PAEPALANTHUS GLAZIOVII Ruhl. in Engl., Pflanzenreich 13 (4-30): 181, fig. 22. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 4, 180, 181, & 290, fig. 22. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40 & 52. 1930; Stapf, Ind. Lond. 4: 518. 1930; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Phytologia 2: 231. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Phytologia 4: 144. 1952; Moldenke, Résumé 98 & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 181, fig. 22. 1903.

This species is based on Glaziou 20016, collected among rocks at Biribiry, Minas Gerais, Brazil, flowering in April, and deposited in the herbarium of the Botanisches Museum at Berlin, now destroyed. It is known thus far only from the original collection. Ruhland (1903) comments that the "Planta habitu valde insignis. Ramificatio pseudo-dichotoma non adeo pulchra ut in P. guianensi

vel dichotoma, cum interdum ramis tres in uno loco quasi inserti sint. Habitu minus compacto speciebus subsect. Polyactidis § Effusi haud dissimilis."

Citations: BRAZIL: Minas Gerais: Glaziou 20016 (B--type, Br--isotype, N--photo of isotype, Z--photo of isotype).

PAEPALANTHUS GLEASONII Moldenke, Known Geogr. Distrib. Erioc. 6 & 49, hyponym (Feb. 9, 1946), Phytologia 2: 140. July 8, 1946.  
Synonymy: Paepalanthus robustus Gleason, Bull. Torrey Bot. Club 58: 330--331. 1931 [not P. robustus Alv. Silv., 1908].

Bibliography: Gleason, Bull. Torrey Bot. Club 58: 330--331. 1931; A. W. Hill, Ind. Kew. Suppl. 9: 200. 1938; Fedde in Just. Bot. Jahresber. 59 (2): 19. 1939; Moldenke, Known Geogr. Distrib. Erioc. 6, 49, & 53. 1946; Moldenke, Phytologia 2: 140. 1946; Moldenke, Alph. List Cit. 4: 985. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 64, 66, & 209. 1949; Moldenke, Phytologia 4: 144--145. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 175. 1953; Moldenke, Résumé 72, 75, 328, & 487. 1959; Moldenke, Résumé Suppl. 16: 6. 1968; Moldenke, Phytologia 20: 297. 1970; Moldenke, Fifth Summ. 1: 125, 130, & 162 (1971) and 2: 589 & 952. 1971; Moldenke, Phytologia 25: 229. 1973.

This species is based on G. H. H. Tate 622, collected at the "Summit of Peak 7", Mount Duida, Bolívar, Venezuela, at an altitude of 7100 feet, and is deposited in the Britton Herbarium at the New York Botanical Garden. Gleason (1931) notes that "It is obviously closely related to P. convexus Gleason, but is much larger in all its dimensions; it is similarly closely related to P. subcaulescens Brown, which has broader leaves and much smaller heads." Recent collectors have encountered it at altitudes of 8500 to 9000 feet in Brazil.

Additional citations: BRAZIL: Roraima: Maguire, Murça Pires, & Maguire 60487 (N).

PAEPALANTHUS GLOBOSUS Ruhl. in Engl., Pflanzenreich 13 (4-30): 143--144. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 126, 143--144, & 290. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 407. 1928; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98 & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971.

This species is based on Glaziou 15537, collected at Caraça, in the Serra de Capanema, Minas Gerais, Brazil, flowering in February, and deposited in the herbarium of the Botanisches Museum at Berlin. The original printed labels of the type collection are inscribed "Rio de Janeiro", but the locality of collection is definitely in Minas Gerais. Silveira (1928) cites A. Silveira 433 from the Serra do Batatal in the same state, collected in 1906. The species is thus far known only from three collections.

Citations: BRAZIL: Minas Gerais: Glaziou 15537 [Macbride photos

10611] (B—type, N—photo of type, N—photo of type, W—photo of type, Z—isotype); A. Lutz 1073 (Ja).

PAEPALANTHUS GNEISSICOLA Alv. Silv., Fl. Mont. 1: 124—126, pl. 77. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 124—126 & 407, pl. 77. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98 & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 77. 1928.

This species is based on A. Silveira 597, collected "In solo gneissicolo in Serra do Caparaó", Minas Gerais, Brazil, in April, 1913, and deposited in the Silveira herbarium. On page 407 of his work (1928) Silveira gives the collection date as "1911", but whether this is a typographic error or is meant to be a correction of the date given on page 126 is not clear. He comments that "A. P. caparoensi Ruhl. foliis obtusis bracteis involucrentibus acutis, appendicibus et stigmatibus praecipue differt".

Citations: BRAZIL: Espirito Santo: Irwin 2758 (N). Minas Gerais: Schwacke s.n. [Herb. Mus. Nac. Rio Jan. 29465] (N, S).

PAEPALANTHUS GOMESII Alv. Silv., Fl. Mont. 1: 67—69, pl. 39. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 67—69 & 407, pl. 39. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moacyr do Amaral Lisboa, Revist. Esc. Minas 9. 1951; Moldenke, Résumé 98 & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971; Moldenke, Phytologia 26: 196 (1973) and 29: 313 & 314. 1974.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 39. 1928.

The type of this species was collected by Dr. Francisco de Magalhães Gomes in the Serra do Capanema, Minas Gerais, Brazil, in March of 1893. On page 69 of Silveira's work (1928) no collection number is given for the type collection, but on page 407 of the same work it is cited as F. M. Gomes 413. On page 69 what appears to be a second collection is cited as "in campis ex Serra do Batal, prope Capanema: Alvaro da Silveira, Apr. 1905; n. 413 in herbario Silveira". Silveira comments that the "Species cum P. eriophaeo Ruhl. et P. Blepharophoro (Bong. Koern.) affinis, sed foliis glabris et bracteis involucrentibus paucis flavisque diversa".

Citations: BRAZIL: Minas Gerais: Macedo 2792 (N, S).

PAEPALANTHUS GONCALENSIS Alv. Silv., Fl. Mont. 1: 259—260, pl. 172 prim. [=171]. 1928.

Synonymy: Paepalanthus goncalensis Alv. Silv. apud A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938.



Bibliography: Alv. Silv., Fl. Mont. 1: 259--260 & 407, pl. 172 prim. [=171]. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98 & 487. 1959; Moldenke, Phytologia 20: 367 & 368. 1970; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971; Moldenke, Phytologia 25: 241. 1973.

This species is based on Álvaro da Silveira 787, collected "in campis arenosis prope S. Gonçalo, inter Serro et Diamantina, in Serra Geral", Minas Gerais, Brazil, in June of 1925 and deposited in the Silveira herbarium. On page 407 of the same work (1928) Silveira records the type as "Silveira 787 prope S. Gonçalo do Serros 1926". It should also be noted that on page 260 of his work he cites plate "CLXXI", but the plate is actually numbered "CLXXII" and is the first of two plates so numbered. I am therefore citing it as "pl. 172 prim. [=171]". The true plate 172, which I am citing as "pl. 172 bis" represents P. barreirensis Alv. Silv. There seems to be no plate 173 at all. Silveira comments that the "Species ad affine P. homomallo (Bong.) Mart. foliis marginibus incrassatis et non canaliculato-revolutis praecipue differt".

Citations: BRAZIL: Minas Gerais: Black & Magalhães 51-11797 (Z), 51-11859 (Z); L. B. Smith 6833 (N, Z), 6837 (W--2120202).

PAEPALANTHUS GOUNELLEANUS Beauverd, Bull. Herb. Boiss., ser. 2, 8: 292, fig. 11 B 9--17. 1908.

Bibliography: Beauverd, Bull. Herb. Boiss., ser. 2, 8: [291] & 292, fig. 11 B 9--17. 1908; Prain, Ind. Kew. Suppl. 4: 170. 1913; Stapf, Ind. Lond. 4: 518. 1930; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98 & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971; Moldenke, Phytologia 25: 229. 1973.

Illustrations: Beauverd, Bull. Herb. Boiss., ser. 2, 8: [291], fig. 11 B 9--17. 1908.

This species is based on "Sans No. Itatlaya (Bresil) Sitio de Ramos, altitude 2000 m.: leg. E. Gounelle, fevrier 1899", deposited in the Herbarium Boissier at Geneva. This type locality has hitherto been regarded by me as in Minas Gerais, but according to a letter recently received by me from Dr. Pabst [see under P. glabrifolius] it is most likely in the state of Rio de Janeiro.

Beauverd (1908) comments that "Voisine des Paepalanthus acantholimom Ruhland et P. aretioides Ruhl. cette nouvelles espèce se distingue de ses deux congénères par ses capitules beaucoup plus petits et ses pédoncules rigides très tordus beaucoup plus courts que ceux du P. acantholimom (11 cm.) et deux fois plus longs que ceux du P. aretioides (3--4 cm); l'extrémité échancrée-cordée des sépales mâles et des pétales femelles lui assignant en outre une place à part dans le groupe des Rosulati

auquel elle sa partie, en portant dès lors à cinq des espèces qui en font partie."

Thus far it is known only from the original collection.

*PAEPALANTHUS GRANATENSIS* Körn. in Mart., Fl. Bras. 3 (1): 403--404. 1863.

Synonymy: *Dupatya granatensis* (Körn.) Kuntze, Rev. Gen. Pl. 2: 45. 1891. *Dupatya granatensis* Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 403--404 & 507. 1863; Kuntze, Rev. Gen. Pl. 2: 45. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 201, 205--206, [283], & 290. 1903; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Ericoc. 5, 30, & 49. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 61 & 209. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 67, 280, & 487. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Moldenke, Fifth Summ. 1: 118 & 481 (1971) and 2: 952. 1971.

According to Körnicke's original (1863) description, the type of this species is Linden 2152, and this collection number is repeated by Ruhland (1903), collected in the vicinity of Bogotá, Cundinamarca, at an altitude of 2400 m., Colombia, flowering in March, and originally deposited in the Berlin herbarium. He cites also H. Karsten s.n. from the same locality, deposited in the Vienna herbarium. Allen collected the species at 11,000 feet altitude, also in Cundinamarca, while Hermann found it there at 2800 m., flowering in June, and describes his collection as a toptype collection.

Macbride's type photograph number 25169 is of Linden 1252 in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva. Apparently he regarded the "1252" on the label of this specimen as an error for the "2152" on the Berlin label. In this he is probably correct, and so I am regarding the Geneva specimen as an isotype.

Citations: COLOMBIA: Cundinamarca: P. H. Allen 3001 (W—1951927); Hermann 11352 (W—1906261); Linden 1252 [Macbride photos 25169] (N—photo of isotype, N—photo of isotype, W—photo of isotype), 2152 (B—isotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

*PAEPALANTHUS GRAO-MOGOLENSIS* Alv. Silv., Fl. Mont. 1: 133--134, pl. 83. 1928.

Synonymy: *Paepalanthus grão-mogolensis* Alv. Silv., Fl. Mont. pl. 83. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 133--134 & 407, pl. 83. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl.

2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98, 325, & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 584 & 952. 1971; Moldenke, Phytologia 25: 241. 1973.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 83. 1928.

The type of this species is Alvaro da Silveira 805, collected "In cerrados, locis siccis, prope Grão Mogol", Minas Gerais, Brazil, in July of 1926 and deposited in the Silveira herbarium. Silveira (1928) says of it "Species a P. polygono Koern. pilis acutis, foliis primo ciliatis ac valde angustioribus et forma bractearum involucrantium praecipue differt." Thus far it is known only from the original collection.

PAEPALANTHUS GRISEUS Moldenke, Phytologia 2: 380, num. nud. 1947; Moldenke in Maguire, Bull. Torrey Bot. Club 75: 197—198. 1948.

Bibliography: Moldenke, Phytologia 2: 380. 1947; Moldenke in Maguire, Bull. Torrey Bot. Club 75: 197—198. 1948; Moldenke, Alph. List Cit. 3: 701. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 66 & 209. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 175. 1953; Moldenke, Résumé 75 & 487. 1959; Moldenke, Phytologia 20: 297. 1970; Moldenke, Fifth Summ. 1: 130 (1971) and 2: 952. 1971.

This species is based on Maguire & Fanshawe 23244, said to be "locally frequent" in damp sand on the Kaieteur Savanna, Guyana, collected on May 5, 1944, and deposited in the Britton Herbarium at the New York Botanical Garden. The collectors note that the "Leaves [are] erect, spreading, to 10 cm. [long]". The species resembles P. tatei Moldenke in habit, but is smaller in all its parts.

Citations: GUYANA: Maguire & Fanshawe 23244 (N—type).

PAEPALANTHUS GUSTAVII Alv. Silv., Fl. Mont. 1: 227—228, pl. 150. 1928.

Synonymy: Paepalanthus gustarvii Alv. Silv., Fl. Mont. 1: pl. 150, sphalm. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 227—228 & 407, pl. 150. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199, 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 12 & 49. 1946; Moldenke, Phytologia 2: 380. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98, 325, & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 584 & 952. 1971; Moldenke, Phytologia 26: 143. 1973.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 150. 1928.

This species is based on Alvaro da Silveira 744, collected in the Serra do Chapadão, Minas Gerais, Brazil, in April of 1925 and is deposited in the Silveira herbarium. On page 407 of his work (1928) Silveira adds the note that the type was actually gathered "prope Serra da Canastra". He comments that the "Species a cl.

Gustavo Amancio da Silveira, caro comite meo in itinere ad Serra do Chapadão, dedicada". Worsdell (1941) adopts the incorrect spelling of the specific epithet since it occurs on the illustration cited by him.

Thus far this species is known only from the original collection.

PAEPALANTHUS GUYANENSIS Klotzsch in Schomb., Reise Brit.-Guian.

3: 1064, hyponym [as "guianensis"]. 1848; Körn. in Mart., Fl. Bras. 3 (1): 347. 1863.

Synonymy: Paepalanthus guianensis Klotzsch in Schomb., Reise Brit.-Guian. 3: 1064, hyponym. 1848. Paepalanthus guyanensis Kunth apud Körn. in Mart., Fl. Bras. 3 (1): 300. 1863. Dupatya guyanensis (Klotzsch) Kuntze, Rev. Gen. Pl. 2: 745. 1891. Dupatya guyanensis Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902.

Bibliography: Schomb., Reise [Vers. Fauna & Fl.] Brit.-Guian. 3: 1064. 1848; Körn. in Mart., Fl. Bras. 3 (1): 277, 300, 347, & 507. 1863; Benth. & Hook. f., Gen. Pl. 3 (2): 1023. 1883; Kuntze, Rev. Gen. Pl. 2: 745. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 4, 5, 180, 181, & 290, fig. 21. 1903; Stapf, Ind. Lond. 4: 518. 1930; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 40, 42, & 51. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 6 & 49. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 66 & 209. 1949; Bourdu, Bull. Soc. Bot. France 104: 156. 1957; Moldenke, Résumé 75 & 487. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 402. 1960; Moldenke, Phytologia 19: 35. 1969; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 190. 1969; Moldenke, Phytologia 20: 297. 1970; Moldenke, Fifth Summ. 1: 130 (1971) and 2: 584 & 952. 1971; Moldenke, Phytologia 26: 253. 1973.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 180, fig. 21. 1903.

This species is based on an unnumbered collection by Richard Schomburgk from "auf sandigen Stellen in der Savanne, in der Umgebung des Rué-imeru-Falls", Guyana, flowering in September and October. On page 181 of his work (1903), Ruhl. spells the specific epithet "guianensi" [i.e., guianensis] although in all other places he adopts the spelling "guyanensis", the first validly published spelling. He cites Dupatya dichotoma Kuntze as a synonym, but I keep this separate as a synonym of Paepalanthus dichotomus Klotzsch, an obviously closely related taxon.

Gleason, in his unpublished Flora of British Guiana, describes P. guyanensis as follows: "Stems 3—7 cm. tall, freely branched, leafy throughout; leaves very crowded, erect or appressed and overlapping, narrowly linear, obtuse, hirsute; heads solitary

near the end of the branches, nearly or quite sessile among the leaves, 5 mm. wide; bracts oblong, appressed." He cites only the original collection and regards the species as endemic.

Citations: GUYANA: Rich. Schomburgk "A" (B--type, Z--isotype).

MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS GYROTRICHUS Ruhl. in Engl., Pflanzenreich 13 (4-30): 132. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 6, 124, 132, 137, & 290, fig. 1 F. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 407. 1928; Moldenke, Known Geogr. Distrib. Ericoc. 12 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Phytologia 4: 145. 1952; Moldenke, Résumé 98 & 487. 1959; Rennó, Levant. Herb. Inst. Agron. 70. 1960; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 158 & 190. 1969; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971; Moldenke, Phytologia 26: 191 (1973) and 29: 311. 1974.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 6, fig. 1 F. 1903.

This species was based by Ruhland (1903) on three collections:

(1) W. Schwacke 8498 from "zwischen Diamantina und Formação, unter Felsen", flowering in April, (2) Glaziou 19986 from "Perpetua, bei Diamantina", flowering in April, and (3) Sena s.n. [Schwacke herb. 14555] from Serra do Cipó, flowering in June, all in Minas Gerais, Brazil, and all deposited in the Berlin herbarium. He comments that the "Species habitu P. myocephalo Mart. similis, sed plane ad eo diversa. Insignis praeter cetera floris pilorum forma. (Specimina jam destructa erant). Proxime ad P. pullum Koern. accedit, cujus forsán modo varietas est. Specimina a cl. Glaziou collecta paullo validiora pr. p. caule breviter elongato et ramuloso instructa sunt." Silveira (1928) cites one of his own collections from Diamantina in 1909.

Irwin and his associates found this species "in soil-filled cracks of outcrops in region of high campo slopes, outcrops, and creek margins" at 1400 m. altitude, flowering and fruiting in February. Williams & Assis found it on a campo, flowering in May: their 6864 is a mixture with P. exiguus (Bong.) Körn.

Additional citations: BRAZIL: Minas Gerais: Glaziou 19986 [Macbride photos 22282] (B--cotype, N--photo of cotype, W--photo of cotype); Irwin, Maxwell, & Wasshausen 20247 (N, N); Schwacke 8498 [Herb. Jard. Bot. Belo Horiz. 26661] (N--cotype); Sena s.n. [Herb. Schwacke 14555] (B--cotype); Williams & Assis 6864, in part (E--1309479, N).

PAEPALANTHUS HABENULIFER Alv. Silv., Fl. Mont. 1: 263--265, pl. 175. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 251, 263--265, & 407, pl. 175. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Ericoc. 12 &

49. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 84 & 209. 1949; Moldenke, *Résumé* 98 & 487. 1959; Moldenke, *Fifth Summ.* 1: 162 (1971) and 2: 952. 1971; Moldenke, *Phytologia* 26: 193. 1973.

Illustrations: *Alv. Silv.*, *Fl. Mont.* 1: pl. 175. 1928.

This species is based on Alvaro da Silveira 556, collected "In campis arenosis in Serra do Cipó", Minas Gerais, Brazil, in April of 1909 and is deposited in the Silveira herbarium. On page 407 of his work, Silveira (1928) gives the year of collection as "1905", but whether this is a typographic error or is intended as a correction of the date given with the original description is not clear. He comments that the "Species bracteis involucrentibus interioribus valde longis, habenulis imitantibus, et pilis supremis bractearum perigoniorumque mucronatis ac gibbosis ab affinis distinctissima."

Thus far this species is known only from the original collection.

*PAEPALANTHUS HARMSII* Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 216. 1903.

Synonymy: *Paepalanthus multistriatus* Alv. Silv. ex Moldenke, *Résumé Suppl.* 1: 21, in syn. 1959.

Bibliography: Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 214, 216, & 290. 1903; Prain, *Ind. Kew. Suppl.* 3: 126. 1908; Alv. Silv., *Fl. Mont.* 1: 407. 1928; Moldenke, *Known Geogr. Distrib. Erioc.* 12 & 49. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 84 & 209. 1949; Moldenke, *Résumé* 98 & 487. 1959; Moldenke, *Résumé Suppl.* 1: 21. 1959; Moldenke, *Fifth Summ.* 1: 162 (1971) and 2: 586 & 952. 1971.

This species is based on H. de Magalhães 1373, collected in damp places in the Serra de Ibitipoca, Minas Gerais, Brazil, in June, 1896, and deposited in the herbarium of the Botanisches Museum in Berlin, where it was photographed by Macbride as his type photograph number 10613. The type of *P. multistriatus* is H. de Magalhães 1371 in the same herbarium. Ruhland comments that the "Species colore et forma bractearum involucrentium ab affinis bene dignoscenda, cl. Dr. H. Harms dedicata." Silveira (1928) cites H. M. Gomes 268 from the same Serra de Ibitipoca, collected in 1896.

Citations: BRAZIL: Minas Gerais: H. Magalhães 1371 (B), 1373 [Macbride photos 10613] (B--type, N--photo of type, N--photo of type, W--photo of type, Z--isotype).

*PAEPALANTHUS HEMIGLOBOSUS* Alv. Silv., *Fl. Mont.* 1: 181--183, pl. 117. 1928.

Bibliography: Alv. Silv., *Fl. Mont.* 1: 181--183, 186, & 407, pl. 117. 1928; Wangerin in Just, *Bot. Jahresber.* 57 (1): 476. 1937; A. W. Hill, *Ind. Kew. Suppl.* 9: 199. 1938; Worsdell, *Ind. Lond. Suppl.* 2: 183. 1941; Moldenke, *Known Geogr. Distrib. Erioc.* 12 & 49. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 84 & 209. 1949; Moldenke, *Résumé* 98 & 487. 1959; Moldenke,

Fifth Summ. 1: 162 (1971) and 2: 952. 1971; Moldenke, *Phytologia* 25: 161. 1973.

Illustrations: *Alv. Silv.*, *Fl. Mont.* 1: pl. 117. 1928.

This species is based on Álvaro da Silveira 783, collected "In campis arenosis inter Serro et Datas, in Serra Geral", Minas Gerais, Brazil, in June, 1925, deposited in the Silveira herbarium. On page 407 of his work (1928), Silveira gives "1926" as the date of collection of the type, but whether he intends this as a correction of his earlier statement or if it is a typographic error, is not clear. He also notes that this species resembles P. bulbosus *Alv. Silv.* [for differences between these two species see my discussion of P. bulbosus in this series of notes]. Of P. hemiglobosus he says "Species ob capitula magna, bulbis pilorum et pilis bractearum perigoniorumque acutis facile dignoscenda".

Thus far, the species is known only from the original collection.

PAEPALANTHUS HENRIQUEI *Alv. Silv. & Ruhl. ex Ruhl. in Engl., Pflanzenreich* 13 (4-30): 129. 1903.

Synonymy: Paepalanthus henriquei *Ruhl. ex Alv. Silv., Fl. Mont.* 1: 63. 1928. Eriocaulon henriquei *Alv. Silv. & Ruhl. ex Reitz, Sellowia* 7: 124. 1956. Paepalanthus henriquei *Alv. Silv. ex Moldenke, Résumé Suppl.* 1: 21, in syn. 1959.

Bibliography: *Ruhl. in Engl., Pflanzenreich* 13 (4-30): 123, 129, & 290. 1903; Prain, *Ind. Kew. Suppl.* 3: 126. 1908; *Alv. Silv., Fl. Mont.* 1: 58, 63, & 408. 1928; Moldenke, *Known Geogr. Distrib. Erioc.* 12 & 49. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 84 & 209. 1949; *Reitz, Sellowia* 7: 124 (1956) and 11: 31 & 103. 1959; Moldenke, *Résumé* 98 & 487. 1959; Moldenke, *Résumé Suppl.* 1: 21 (1959), 4: 5 (1962), and 17: 10. 1968; *Reitz, Sellowia* 22: 51. 1970; Moldenke, *Fifth Summ.* 1: 162 (1971) and 2: 502 & 584. 1971; Moldenke, *Phytologia* 25: 241. 1973.

The type of this species was collected by Henrique Carlos de Magalhães Gomes (no. 1372) in the Serra de Ibitipoca, Minas Gerais, Brazil, flowering in June, and is deposited in the herbarium of the Botanisches Museum in Berlin, where it was photographed by Macbride as his type photograph number 10614. On the type specimen the binomial is credited only to Silveira.

Silveira (1928) cites H. M. Gomes 258, also from the Serra de Ibitipoca, collected in 1896 and this may possibly be part of the type collection. *Reitz* (1956) cites Rambo 49606 from Santa Catarina, Brazil, and records the vernacular names "capim manso", "capipoatinga", "gravatá manso", and "semprevivas do campo".

*Ruhland* (1903) comments that the "Species cum P. eriophaeo *Ruhl. valde affinis, sed statim pedunculis brevibus atque foliorum indumento differt.*"

Material has been misidentified and distributed in some herbaria under the name Paepalanthus blepharocnemis *Mart.* [a synonym of P. aequalis (Vell.) *J. F. Macbr.*], an obviously closely related species.

Citations: BRAZIL: Minas Gerais: Magalhães Gomes 1372 [Macbride photos 10614] (B—type, N—photo of type, N—photo of type, W—photo of type, Z—isotype); Widgren 333 (Br, N), s.n. [Minas Gerais, 1845] (Br, N). Rio Grande do Sul: Sehnen 5453 (B). Santa Catarina: Rambo 49606 (Le, N, S).

PAEPALANTHUS HERZOGII Moldenke, *Revist. Sudam. Bot.* 4: 17. 1937.

Synonymy: Paepalanthus ruhlandii Herzog ex Lützelburg, *Estud. Bot. Nordést.* 3: 149—150, hyponym (1923) in Fedde, *Repert. Spec. Nov.* 20: 87. 1924 [not P. ruhlandii Alv. Silv., 1903]. Paepalanthus herzogii Macbr. ex Moldenke, *Résumé Suppl.* 12: 11, in syn. 1965.

Bibliography: Lützelburg, *Estud. Bot. Nordést.* 3: 149—150. 1923; Herzog in Fedde, *Repert. Spec. Nov.* 20: 87. 1924; Fedde & Schust. in Just, *Bot. Jahresber.* 53 (1): 61 [43]. 1928; A. W. Hill, *Ind. Kew. Suppl.* 7: 174. 1929; Moldenke, *Revist. Sudam. Bot.* 4: 17. 1937; Moldenke, *Known Geogr. Distrib. Erioc.* 13, 49, & 53. 1946; Hill & Salisb., *Ind. Kew. Suppl.* 10: 158, 1947; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 84 & 209. 1949; Moldenke, *Phytologia* 4: 145. 1952; Moldenke, *Résumé* 98, 328, & 487. 1959; Moldenke, *Résumé Suppl.* 12: 11. 1965; Moldenke, *Fifth Summ.* 1: 162 (1971) and 2: 584, 590, & 952. 1971; Moldenke, *Phytologia* 25: 154. 1973.

This species is based on Lützelburg 278, collected on granite, at 1200 meters altitude, in the Serra Marsalina, central Bahia, Brazil, in August, 1914, where, according to the collector (1923), it is typical of the "carrasco" formation. The type specimen, in the herbarium of the Botanische Staatssammlung in Munich, was photographed there by Macbride as his type photograph number 18724. It should be noted that the type is labeled "278a" and its label indicates "Bom Jesus, 1000 m" as the type locality. It was annotated as "P. herzogii Macbr." by Macbride, but his binomial was never validly published by him as far as I have been able to determine.

Herzog (1924) says that the species is "Aus der Verwandtschaft von P. brachypus Kunth; aber durch die wenig zahlreichen kurzen und fast kahlen Blätter gut unterschieden."

Citations: BRAZIL: Bahia: Lützelburg 278a [Macbride photos 18724] (Mu—type, N—photo of type, W—photo of type, Z—isotype).

PAEPALANTHUS HETEROCAULON Alv. Silv., *Fl. Mont.* 1: 203—205, pl. 134. 1928.

Bibliography: Alv. Silv., *Fl. Mont.* 1: 203—205 & 408, pl. 134. 1928; Wangerin in Just, *Bot. Jahresber.* 57 (1): 476. 1937; A. W. Hill, *Ind. Kew. Suppl.* 9: 199. 1938; Worsdell, *Ind. Lond. Suppl.* 2: 183. 1941; Moldenke, *Known Geogr. Distrib. Erioc.* 13 & 49. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 84 & 209. 1949; Moldenke, *Résumé* 98 & 487. 1959; Moldenke, *Résumé Suppl.* 12: 4. 1965; Moldenke, *Fifth Summ.* 1: 162 (1971) and 2: 952. 1971.



Illustrations: Alv. Silv., Fl. Mont. 1: pl. 134. 1928.

This species is based on A. Silveira 775, collected "In campis arenosis, inter Serro et Diamantina, in Serra Geral", Minas Gerais, Brazil, in January of 1925 and deposited in the Silveira herbarium. On page 408 of his work (1928), Silveira gives the year of collection of the type as "1926", but whether this is intended as a correction of the date given by him on page 205 or represents a typographic error, is not clear.

Citations: BRAZIL: Rio de Janeiro: Strang 244 [Herb. Cent. Pesq. Florest. 786] (2).

PAEPALANTHUS HETEROPUS Alv. Silv., Fl. Mont. 1: 139--140, pl. 87. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 139--140 & 408, pl. 87. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98 & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 87. 1928.

The type of this species was collected by Álvaro Adolpho da Silveira (no. 686) "In campis arenosis prope Itambé do Serro", Minas Gerais, Brazil, in April, 1918, and is deposited in the Silveira herbarium. Curiously, on page 408 of his work (1928), Silveira writes the name of the type locality as "Serra do Itambé". Thus far, the species is known only from the original collection.

PAEPALANTHUS HETEROTRICHUS Alv. Silv., Fl. Mont. 1: 200--201, pl. 132. 1928.

Bibliography: Alv. Silv., Fl. Mont. 1: 200--201 & 408, pl. 132. 1928; Wangerin in Just, Bot. Jahresber. 57 (1): 476. 1937; A. W. Hill, Ind. Kew. Suppl. 9: 199. 1938; Worsdell, Ind. Lond. Suppl. 2: 183. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Résumé 98 & 487. 1959; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971.

Illustrations: Alv. Silv., Fl. Mont. 1: pl. 132. 1928.

The type of this species was collected by J. G. Michaeli "In campis arenosis in Serra do Cipó", Minas Gerais, Brazil, in August of 1921 and is no. 721 in the A. Silveira herbarium. Silveira (1928) comments that the "Species ob pilositatem pedunculorum distinctissima". It is known thus far only from the original collection.

PAEPALANTHUS HILAIREI Körn. in Mart., Fl. Bras. 3 (1): 332, pl. 46, fig. 2. 1863.

Synonymy: Eriocaulon maximiliani Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 620, pl. 1. 1831 [not E. maximiliani Schrad., 1824]. Eriocaulon bongardii A. St. Hil., Voy. Distr. Diam. 2: 444. 1833. Paepalanthus maximiliani Kunth, Enum. Pl. 3:

513—514. 1841. Eriocaulon bongardi Kunth ex D. Dietr., Syn. Pl. 5: 261. 1852. Eriocaulon bongardi St. Hil. apud Steud., Syn. Pl. Glum. 2: [Cyp.] 273 & 333. 1855. Paepalanthus hilairei var.  $\alpha$  Körn. in Mart., Fl. Bras. 3 (1): 332. 1863. Eriocaulon (Paepalanthus) maximiliani Mart. ex Körn. in Mart., Fl. Bras. 3 (1): 332, in syn. 1863. Dupatya hilairei (Körn.) Kuntze, Rev. Gen. Pl. 2: 746. 1891. Dupatya hilairei Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus hilairei f. typica Ruhl. in Engl., Pflanzenreich 13 (4-30): 195. 1903. Eriocaulon maximiliani Mart. [in part] ex Moldenke, Known Geogr. Distrib. Erioc. 37, in syn. 1946 [not E. maximiliani Schrad., 1824]. Paepalanthus hilairei Körn. ex Angely, Fl. Paran. 10: 5, sphalm. 1957. Paepalanthus hilairei f. compacta Ruhl. ex Moldenke, Résumé Suppl. 1: 21, in syn. 1959. Paepalanthus hilairei Körn. ex Rennó, Levant. Herb. Inst. Agron. 70, sphalm. 1960. Paepalanthus halairi Körn. ex Moldenke, Résumé Suppl. 6: 10, in syn. 1963. Paepalanthus hilairei Körn. ex Moldenke, Résumé Suppl. 12: 11, in syn. 1965. Paepalanthus hilaireae Kunth ex Moldenke, Phytologia 25: 241, in syn. 1973. Actinocephalus hilairei Körn., in herb.

Bibliography: Roem. & Schult., Mant. 2: 470. 1824; Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 620 & 637. 1831; Bong., Ess. Monog. Erioc. 5 & 6. 1831; A. St. Hil., Voy. Distr. Diam. 2: 443—444. 1833; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Kunth, Enum. Pl. 3: 512—514, 516, 572, & 625. 1841; Mart., Flora 24, Beibl. 2: 35. 1841; D. Dietr., Syn. Pl. 5: 261. 1852; Steud., Syn. Pl. Glum. 2: [Cyp.] 273—274, 333, & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 332, 499, & 507, pl. 46, fig. 2. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 877 & 878 (1893) and pr. 1, 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 7, 10, 190, 195—196, 254, 284, 286, & 290, fig. 2 C. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 294. 1908; Lützelburg, Estud. Bot. Nordést. 3: 149. 1923; Alv. Silv., Fl. Mont. 1: 200 & 408. 1928; Stapf, Ind. Lond. 4: 518. 1930; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 43 & 44, fig. 16 C. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Moldenke, Known Geogr. Distrib. Erioc. 13, 32, 37, 49, & 50. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 877 & 878 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Alph. List Cit. 3: 710 & 731. 1949; Moldenke, Phytologia 3: 142 (1949) and 4: 145. 1952; Mendes Magalhães, Anais V Reun. Anual Soc. Bot. Bras. 236. 1956; Angely, Fl. Paran. 10: 5. 1957; Moldenke, Résumé 98, 286, 290, 325, 326, 487, & 494. 1959; Moldenke, Résumé Suppl. 1: 20 & 21. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Rennó, Levant. Herb. Inst. Agron. 70. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 877 & 878 (1960) and pr. 3, 2: 402. 1960; Moldenke, Résumé Suppl. 3: 34 (1962), 6: 10

(1963), and 12: 11. 1965; Tomlinson in C. R. Metcalfe, *Anat. Monocot.* 3: 160, 162, 174, 187, & 189—191. 1969; Moldenke, *Fifth Summ.* 1: 162 & 414 (1971) and 2: 494, 505, 584, 586, & 952. 1971; Moldenke, *Biol. Abstr.* 56: 3000. 1973; Moldenke, *Phytologia* 25: 229, 238, 239, & 241 (1973) and 26: 229. 1973.

Illustrations: Bong., *Mém. Acad. Imp. Sci. St. Pétersb.*, ser. 6, 1: pl. 1. 1831; Körn. in Mart., *Fl. Bras.* 3 (1): pl. 46. 1863; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 7, fig. 2 C. 1903; Ruhl. in Engl. & Prantl, *Nat. Pflanzenfam.*, ed. 2, 15a: 43, fig. 16 C. 1930.

Körnigke based this species, insofar as his typical "var.  $\alpha$ " is concerned, on the following cotype specimens: from Minas Gerais - (1) Martius 897, (2) Schüch s.n., (3) Ackerman s.n., (4) P. Clausen 3, (5) Arendt s.n., (6) in arenosis et lapidosis Serra Lenheiro, L. Riedel s.n., and (7) S. Joze atque prope S. João, Junio, L. Riedel s.n., and from Rio de Janeiro - (8) inter Rio de Janeiro et Campos, Sellow s.n. and (9) near Sebastianopolis, Lhotzky s.n. He describes the typical form as "var.  $\alpha$ . foliis caulinis glabris vel subtus breviter pilosulis, ciliatis; foliis ramorum ciliatis, ceterum glabris". However, his binomial is obviously only a new name for Eriocaulon maximiliani Bong., the specific epithet of which was not available for use in the genus Paepalanthus because of Schrader's homonym in 1824. Therefore Bongard's type specimen should be regarded as the actual type of P. hilairei. This appears to be L. Riedel 289. Macbride photographed a Pohl collection in the Munich herbarium as his type photograph number 18702, but this specimen, as has proved true in the case of many of the photographs which he took, is not the type of anything.

It should be noted that the Eriocaulon maximiliani of Martius is in part Paepalanthus hilairei and in part Syngonanthus nitens var. filiformis (Bong.) Ruhl., while E. maximiliani Schrad. is a synonym of P. ramosus (Wikstr.) Kunth.

Körnigke's P. hilairei var.  $\beta$  is what we now call P. ramosus; his var.  $\gamma$  is what we now call P. hilairei var. maximiliani Ruhl.; while his var.  $\delta$  is P. hilairei var. pohlianus Moldenke and his var.  $\epsilon$  is P. hilairei var. plauhyensis Ruhl.

Kunth (1841) comments that "E. Maximiliani (Schrad. ?) Bong. est Paepalanthus Maximiliani", but actually Bongard's plant is P. hilairei and Schrader's is P. ramosus. Some authors in the past have regarded E. bongardi Kunth as a separate and valid specific taxon.

Because of the considerable confusion over the identity of the various plants referred to in the synonymy above, it may be worthwhile to repeat here the original descriptions of some of them. Bongard's Eriocaulon maximiliani (1831) is described as "Caule ramoso, dense folioso; foliis caulinis basi vaginantibus, patentibus, lanceolato-acuminatis, canaliculatis; junioribus cil-

iatis; pedunculis pubescentibus; vaginis glabris".

Schrader's Eriocaulon maximiliani (1824) is described as "Caulis 2-pedalis, superne in ramos 3--4 cauli similes divisus, foliosus. Folia coriacea, supra glabra, subtus pubescentia, margine pilis longioribus ciliata; radicalia 3--4-pollicaria, lineari-lanceolata, superne attenuata, plana; caulina 1 1/2 -poll., amplexicaulia, ovato-lanceolata, longissime acuminata, canaliculata, subsquarrosa. Umbella e pedunculis 300--400 pluribusve subbipollicaribus pubescentibus, basi ochreatis. Capitula magnitudine grani piperis nigri, obovata, apice albo-pilosa. Involucri foliola imbricata, apice rotundata, capitulo paulo breviora calyceque ciliata. Affinis Eriocaulo ramoso Wikstr."

Paepalanthus maximiliani Kunth is described by Kunth (1841) as follows: "P. Maximiliani. Caule ramoso, dense folioso; foliis caulinis basi vaginantibus, patentibus, lanceolato-acuminatis, canaliculatis; junioribus ciliatis; pedunculis pubescentibus; vaginis glabris. Bong. Eriocaulon Maximiliani Schrad in Roem. et Schult. Mant. 2. 470\*)? Bong. in Act. Petrop. 6. 1. 620. 637, t. 1. - Brasilia, in arenosis et lapidosis Serra Lenheira et de St. Jose. (Luschnath prope Tejuco legit [v.s.]. 4." He continues with details, in his usual fashion: "Caulis erectus, ramosus, ad insertiones foliorum pilosus. Folia basi dilatata caulem amplectentia, patentia, squarrosa, supra canaliculata, subtus convexa, mucronata, subpungentia, juniora pilosiuscula margineque pilis albis ciliata, demum glabriuscula, 2 1/2 - 3-pollicaria. Pedunculi creberrimi (circa 300), umbellati, aequales, 3--4-pollicares, pubescentes. Vaginae glabrae, apice oblique fissae. Capitula subglobosa, albo-lanata, magnitudine seminis piperis nigri. Bractee involucrantis steriles, breves, ovato-oblongae, ciliatae; bractee flores stipantes acuminatae, ad apicem pilosae. Receptaculum pilosum. Flores masculi et feminei mixti; illi pedicellati: Sepala 3 exteriora acuta, apice pilosa; 3 interiora in tubum obconicum, apice 3-lobum concreta, acuta. Antherae oblongae, flavae. Fem.: Sepala 3 exteriora oblonga, acuta, margine pilosa; 3 interiora libera, ovata, acuta, basi angustiora, margine pilis longis obsita. Styli (appendices Bong.) simplices, filiformes. Capsula tricocca. Semina lineis longitudinalibus transversalibusque rugulosa. Pili bractearum et calycis exterioris masculi et feminei breves, albi, opaci. (Bong.) Differt a planta Schraderiana statura altiore, pedunculis longioribus, squamis (bracteis involucrantibus) capitulo multo brevioribus. (Bong.) Specimina a Sellowio in Serra da Piedade lecta a Bongardianis differunt pedunculis glabris (potius ob pilos delapsos glabratis?)." He cites, and apparently uses as the basis of his description, a Luschnath unnumbered specimen collected near Tejuco "in arenosis et lapidosis Serra Lenheira et de St. Jose". In this same work, Kunth keys out the species as follows: "Staminibus 3--6 (sive partibus calycis ternariis); capitulis pilosolanatis; stigmata indivisa (sepala exteriora feminea fructifera haud rigescentia?); umbellata, caulescentia, pedunculis in umbellum dispositis aequalibus". In his discussion of P. poly-

anthus (Bong.) Kunth he notes that it "Differt a P. Maximiliani caulibus caespitosis, simplicibus, foliis radicalibus lato-lanceolatis, caulinis adpressis, planis, pedunculis dimidio brevioribus, pilosis, vaginis bifidis".

Ruhland (1903) cites Körnicke's original publication as page "323" instead of 332 as it actually is. He differentiates the typical form of this species from the other recognized forms as "Differt foliis caulinis glabriusculis vel pilis brevibus sparsis ornatis; capitulis maturis globosis, persistenter niveo-villosis; bracteis involucrentibus floribus reflexis cito inconspicuis". He cites from Minas Gerais: Glaziou 15516, Pohl 3634, L. Riedel s.n. [Serra Lenheiro, S. José, & S. João], & Silveira 3; from Rio de Janeiro: Lhotzky s.n. and Sellow s.n.; from Goiás: Glaziou 22321; and from "zwischen Alegres und Trinidad" Pohl 2033.

Recent collectors describe P. hilairei as an erect plant, to 1 m. tall, with white flower-heads, and have found it growing on campos slopes. Irwin and his associates found it "on steep sandy slopes with sandstone outcrops at summit". It has been encountered at 1300 m. altitude, flowering in February and from April to September.

Paepalanthus hilairei f. compacta, which Ruhland apparently never got around to publishing in his formal monograph of the family, seems to be based on Glaziou 22321 in the Brussels herbarium and P. Clausen s.n. at Berlin. It should also be noted that Eriocaulon maximiliani Bong. is cited by Körnicke (1863) as the basis for his Paepalanthus hilairei var. α.

Material of this species has been misidentified and distributed in some herbaria under the names Eriocaulon maximiliani Schrad. and E. rigidum Bong. On the other hand, the Ackermann s.n. [1832], distributed as P. hilairei, is actually P. claussenianus Körn., Clausen 267 and Martius 880, 886, 897, s.n. [In distr. adamant. Majo 1818], and s.n. [In districtu adamant. ad Curralinho] are P. hilairei var. maximiliani Ruhl. (the last-mentioned being a cotype collection of it), and Ackerman s.n. [1832] and Lucae s.n. [Tijuca] are P. ramosus (Wikstr.) Kunth. The Clausen specimen cited below from the Cornell University herbarium was previously cited by me (1952) from the Britton Herbarium, from which it was later transferred to Cornell. The Glaziou 15516 cited by Ruhland (1903) is actually P. ramosus (Wikstr.) Kunth.

Additional citations: BRAZIL: Bahia: Lützelburg 27 (N). Goiás: Cutler 8040 (N); Glaziou 22321 (Br, W--1185376). Minas Gerais: Archer & Mello Barreto 5016 [Herb. U. S. Nat. Arb. 177511] (Be--39317, W--2121795); Arendt s.n. (B); P. Clausen s.n. [1834] (Br), s.n. [Aug.--April 1840] (Br, Br), s.n. (B); Glaziou 17301 (Br, N); Irwin, Maxwell, & Wasshausen 20138 (N, Z); Lhotzky s.n. [prope Sebastianopol] (B); Macedo 2759 (N, S); Mello Barreto 700 [Herb.

Jard. Bot. Bello Horiz. 4811; Herb. U. S. Nat. Arb. 236376] (W—2109953), 2499 [Herb. Jard. Bot. Bello Horiz. 7880; Herb. U. S. Nat. Arb. 236368] (W—2109985), 2524 [Herb. Jard. Bot. Bello Horiz. 8228; Herb. U. S. Nat. Arb. 236397] (W—2109990), 4714 [Herb. Jard. Bot. Bello Horiz. 17544; Herb. U. S. Nat. Arb. 236403] (W—2121716); Mexia 5764 (S, W—1571903); L. Riedel 289 (M—cotype, S—cotype), s.n. [Minas] (Br); Sellow B.553, Ar.5, P.3 (B, B). State undetermined: P. Clausen s.n. (It); Glaziou 15516 (Br); Sellow s.n. [Brasilia] (Br). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B, B, B, B); Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: pl. 1. 1831 (N, Z); Körn. in Mart., Fl. Bras. 3 (1): pl. 46. 1863 (B).

PAEPALANTHUS HILAIREI var. MAXIMILIANI Ruhl. in Engl., Pflanzenreich 13 (4-30): 196. 1903.

Synonymy: Paepalanthus hilairei var.  $\gamma$  Körn. in Mart., Fl. Bras. 3 (1): 332. 1863. Paepalanthus difficilis Ruhl. ex Moldenke, Résumé Suppl. 1: 20, in syn. 1959.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 332. 1863; Ruhl. in Engl., Pflanzenreich 13 (4-30): 196, 290, & 291. 1903; Beauverd, Bull. Herb. Boiss., ser. 2, 8: 294. 1908; Alv. Silv., Fl. Mont. 1: 408. 1928; Moldenke, Known Geogr. Distrib. Erioc. 13 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 84 & 209. 1949; Moldenke, Phytologia 4: 145. 1952; Moldenke, Résumé 98, 325, & 487. 1959; Moldenke, Résumé Suppl. 1: 20. 1959; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 191. 1969; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 580, 584, & 952. 1971.

Ruhland (1903) plainly proposes this trinomial for the P. hilairei var.  $\gamma$  of Körnicke (1863), and this, in turn, was typified by Körnicke by the following four collections, probably all deposited in the Munich herbarium: (1) in altis Minarium: Claussen, (2) in districtu adamant. ad Curralinho: M[artius], (3) in Serra da Piedade: Sellow, and (4) in campis editis arenosis lapidosisque inter Alegres et Rio S. Francisci, Septembri: Riedel. He describes it as "var.  $\gamma$ . apice caulis sterili valde elongato; foliis caulinis ut in var.  $\beta$ ., vel subtus molliter pubescentibus, multo majoribus; foliis ramorum ut in var.  $\beta$ . P. Maximiliani Kunth p.p. (spec. Sellow in Serra da Piedade lect. v.s.)". Ruhland, however, in 1903 cites only Sellow s.n. [Serra da Piedade], Minas Gerais, in the Berlin herbarium, and L. Riedel s.n. "aus hochgelegenen, sandigen und steinigen Campos zwischen Alegres und dem Rio S. Francisco", also in Minas Gerais, flowering in September. He differentiates this variety as "Differt a forma typica foliis caulinis subito angustatis, mucronatis, valde ciliatis, subtus persistenter pubescentibus; vaginis paullo laxioribus quam in confinibus; foliis ramorum ramulorumque primum pubescentibus, dein glabris, rarius subpersistenter pubescentibus (ut in specimenibus a cl. Riedel collectis); caule sterili perspicue elongato; capitulis exacte globosis vel demum verticaliter elongatis, mox

glabrescentibus; foliis omnibus longioribus quam in typo et insequente [var. piahyensis]".

The type of Paepalanthus difficilis appears to be an unnumbered collection made by Ludwig Riedel and merely labeled "Brasilia" in the Berlin herbarium and so annotated by Ruhland. It had previously been annotated by Körnicke as P. hilairei var.  $\gamma$ .

Paepalanthus maximiliani Kunth is cited (in part) by Körnicke (1863) as a synonym of his P. hilairei var.  $\gamma$ , but Kunth's binomial is plainly only a transfer of Bongard's Eriocaulon maximiliani to the genus Paepalanthus, regardless of Kunth's amplification of the diagnosis, and so the name belongs in the synonymy of typical P. hilairei Körn.

Recent collectors describe P. hilairei var. maximiliani as an herb to 1 m. tall, growing in wet fields, in cerrado, and along roadsides, from sealevel to 800 m. altitude, and have found it flowering in April, May, August, and September and in fruit in August. Silveira (1928) cites A. Silveira 696 from the Serra do Cipó, Minas Gerais, Brazil, collected in 1918. The Guillemin 223 cited by me in a previous installment of these notes (1952) proves to be P. ramosus (Wikstr.) Kunth instead.

Material of this variety has been misidentified and distributed in some herbaria as typical P. hilairei Körn., Eriocaulon maximiliani Schrad., E. rigidum Bong., and Actinocephalus hilairei Körn.

Citations: BRAZIL: Goiás: Irwin, Grear, Souza, & Reis dos Santos 14549 (N, Z); Lützelburg 614 (Mu); J. E. Pohl s.n. (Br). Guanabara: L. B. Smith 6401 (W—2120186, W—2120187, Z). Minas Gerais: Archer 4062 (W—1705677); P. Clausen s.n. [1835] (Br, N); F. C. Hoehne 5212 (Mu); Martius 886 (Mu), 888 (Mu), 897 (Br, Mu), s.n. [in distr. adamant. Majo 1818] (Mu), s.n. [In districtu adamant. ad Curralinho] (Mu—cotype), s.n. [Distr. adamant.] (Mu); J. E. Pohl 2033 (Br); L. Riedel s.n. [Brasilia] (B, B); Sellow post B.1300, C.280 (B). State undetermined: P. Clausen 267 (It, N); R. E. Pohl s.n. [in Brasilia; Macbride photos 18702] (Mu, Mu, N—photo, W—photo). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS HILAIREI var. PIAUHYENSIS Ruhl. in Engl., Pflanzenreich 13 (4-30): 196. 1903.

Synonymy: Paepalanthus hilairei var.  $\zeta$  Körn. in Mart., Fl. Bras. 3 (1): 332. 1863. Paepalanthus hilairei var. pihauhyensis Ruhl. ex Alv. Silv., Fl. Mont. 1: 408. 1928. Paepalanthus hilairei var. paihyensis Ruhl. ex Moldenke, Known Geogr. Distrib. Erioc. 49, sphalm. 1946. Paepalanthus piahyensis Ruhl. ex Moldenke, Résumé Suppl. 1: 21, in syn. 1959.

Bibliography: Körn. in Mart., Fl. Bras. 3 (1): 332. 1863; Ruhl. in Engl., Pflanzenreich 13 (4-30): 196 & 290. 1903; Alv. Silv., Fl. Mont. 1: 408. 1928; Moldenke, Known Geogr. Distrib. Erioc. 13

& 49. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 85 & 209. 1949; Moldenke, *Phytologia* 4: 145. 1952; Moldenke, *Résumé* 98, 325, 419, 487, & 494. 1959; Moldenke, *Résumé Suppl.* 1: 21. 1959; Moldenke, *Fifth Summ.* 1: 162 (1971) and 2: 584, 588, 778, & 952. 1971.

The type of this variety was collected by George Gardner (no. 2968) somewhere in Piauí, Brazil, and is deposited in the herbarium of the Botanisches Museum in Berlin. The variety is plainly based on Körnicke's *P. hilairei* var. ? , which he has described as "var. ? . foliis omnibus utrinque pilis mollibus incano-villosis: in prov. Piauiensis: Gardner 2968." Silveira (1928) cites A. Silveira 798 from near Serrinha, Grão Mogol, Minas Gerais. As far as I know, these are the only two known collections of the variety.

Citations: BRAZIL: Piauí: G. Gardner 2968 (B--type, W--937185--isotype).

PAEPALANTHUS HILAIREI var. POHLIANUS Moldenke, *Phytologia* 25: 229 & 241, hyponym. 1973; comb. nov.

Synonymy: Paepalanthus hilairei var. ♂ Körn. in *Mart.*, *Fl. Bras.* 3 (1): 332. 1863.

Bibliography: Körn. in *Mart.*, *Fl. Bras.* 3 (1): 332. 1863; Moldenke, *Biol. Abstr.* 56: 3000. 1973; Moldenke, *Phytologia* 25: 229 & 241. 1973.

This variety is based on two collections by R. E. Pohl from "in prov. Gouazensi et Minarum locis altis", probably deposited in the Berlin herbarium but now destroyed. The original description by Körnicke (1863) is "var. J. foliis ramorum supra glabris, subtus pilis subretroscis mollibus dense et persistenter incano-pubescentibus". In *Phytologia* 25: 241 it was erroneously stated that this taxon is based on Körnicke's var. ? .

PAEPALANTHUS HISPIDISSIMUS Herzog ex Lützelburg, *Estud. Bor.*

*Nordést.* 3: 148 & 150, hyponym. 1923; Herzog in *Fedde, Repert. Spec. Nov.* 20: 85. 1924.

Bibliography: Lützelburg, *Estud. Bot. Nordést.* 3: 148 & 150. 1923; Herzog in *Fedde, Repert. Spec. Nov.* 20: 85 & 86. 1924; Fedde & Schust. in *Just, Bot. Jahresber.* 53 (1): 61 [43]. 1928; A. W. Hill, *Ind. Kew. Suppl.* 7: 174. 1929; Moldenke, *Known Geogr. Distrib. Erioc.* 13 & 49. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 85 & 209. 1949; Moldenke, *Phytologia* 4: 145. 1952; Moldenke, *Résumé* 98 & 487. 1959; Moldenke, *Fifth Summ.* 1: 162 (1971) and 2: 952. 1971.

This species is based on Lützelburg 317 from sandstone along the [Alto] Rio de Gurgucia, in southern Piauí, and Lützelburg 12657 from Bom Jesus [do Rio de Contas], in the "Carrasco-Gebiet" of central Bahia, Brazil, deposited in the Munich herbarium. Lützelburg (1923) says that it is also found at Brejo do Dorreio and Parnaguá in southern Piauí. It has been encountered at 1000 m. altitude.



Herzog (1924) comments that "Durch die borstlichen, lang behaarten in ein dichtes Kugelpolster vereinigten Blätter und die fast pappusähnlichen behaarten Scheidenöffnungen auf den ersten Blick leicht zu erkennende ausserst zierliche Art. Wohl am ehesten in die Verwandtschaft von P. Uleanus Ruhl. gehörig."

Macbride photographed Lützelburg 15506 in the Munich herbarium as his type photograph number 18704, but this photograph is of a collection not cited by Herzog. It is also not possible to tell from the photograph if the specimen is part of 15506a or 15506b since the label does not appear in the photograph.

Citations: BRAZIL: Bahia: Lützelburg 15506 [Macbride photos 18704] (N--photo, W--photo), 15506a (Mu, Z), 15506b (Mu). Piauí: Lützelburg 317 (Mu--cotype).

PAEPALANTHUS HOMOMALLUS (Bong.) Mart. ex Körn. in Mart., Fl. Bras. 3 (1): 340. 1863.

Synonymy: Eriocaulon homomallum Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 626. 1831. Eriocaulon heteromallum Kunth ex Steud., Syn. Pl. Glum. 2: [Cyp.] 279 & 334, in syn. 1855. Dupatya heteromalla (Bong.) Kuntze, Rev. Geb. Pl. 2: 746. 1891. Paepalanthus homomallus Mart. apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 402. 1894. Dupatya homomalla Kuntze apud Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902. Paepalanthus homomallus Mart. ex Moldenke, Fifth Summ. 2: 584, in syn. 1971.

Bibliography: Bong., Mém. Acad. Imp. Sci. St. Pétersb., ser. 6, 1: 626. 1831; Bong., Ess. Monog. Erioc. 26. 1831; Steud., Nom. Bot., ed. 2, 1: 585. 1840; Steud., Syn. Pl. Glum. 2: [Cyp.] 279 & 334. 1855; Körn. in Mart., Fl. Bras. 3 (1): 340, 507, & 508. 1863; Kuntze, Rev. Gen. Pl. 2: 746. 1891; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 878 (1893) and 2: 402. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 145. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 6, 8, 214, 217, [283], 286, & 290. 1903; Alv. Silv., Fl. Mont. 1: 260 & 261. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 42. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 145. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 878 (1946) and pr. 2, 2: 402. 1946; Moldenke, Known Geogr. Distrib. Erioc. 13, 30, 35, & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 209. 1949; Moldenke, Alph. List Cit. 3: 855. 1949; Moldenke, Phytologia 4: 145. 1952; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 145. 1959; Moldenke, Résumé 280, 289, & 487. 1959; Moldenke, Résumé Suppl. 1: 21. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 (1960) and pr. 3, 2: 402. 1960; Moldenke, Résumé Suppl. 12: 11. 1965; Tomlinson in C. R. Metcalfe, Anat. Monocot. 3: 159 & 190. 1969; Moldenke, Phytologia 20: 367. 1970; Moldenke, Fifth Summ. 1: 162 & 481 (1971) and 2: 502, 584, & 952. 1971.

This species is based on L. Riedel 1047, "Habitat in glareosis Serra da Lapa", Minas Gerais, Brazil, deposited in the Leningrad herbarium. Macbride photographed an isotype in the Berlin herbar-

ium as his type photograph number 10615. Bongard's original description (1831) is "acaule; foliis caespitosis linearibus obtusiusculis piloso-incanis subhomomallis; pedunculo solitario incano; vagina apice barbata. Tab. XXXIX....Flor. Novembri. 2." His plate appears never to have been published. In this connection Steudel (1855) says "Tabulae nr. 36 et sequentes in opera citato nondum sunt evulgatae sed modo diagnoses nimis breves illustrationes fusiores adhuc expectantes; hinc inter has specie obiter tantum a Bongardo descriptas plures jam prius a Martio et Kunthio et nunc a me ipso sub aliis denominationibus irrepsisse vis dubitari potest." Ruhland (1903) cites only the type collection.

Additional citations: BRAZIL: Minas Gerais: L. Riedel 1047 [Macbride photos 10615] (B--isotype, Br--isotype, N--photo of isotype, N--photo of isotype, S--isotype, Ut--364--isotype, W--photo of isotype). MOUNTED ILLUSTRATIONS: drawings & notes by Körnicke (B).

PAEPALANTHUS HYDRA Ruhl. in Engl., Pflanzenreich 13 (4-30): 202. 1903.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 201, 202, & 290. 1903; Prain, Ind. Kew. Suppl. 3: 126. 1908; Alv. Silv., Fl. Mont. 1: 408. 1928; Ruhl. in Engl. & Prantl, Nat. Pflanzenfam., ed. 2, 15a: 52. 1930; Moldenke, Known Geogr. Distrib. Eric. 13 & 49. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 85 & 209. 1949; Moldenke, Résumé 98 & 487. 1959; Rennó, Levant. Herb. Inst. Agron. 70. 1960; Moldenke, Fifth Summ. 1: 162 (1971) and 2: 952. 1971.

This species is based on two collections from Minas Gerais, Brazil, deposited in the Berlin herbarium: (1) Schwacke 12040 from damp sandy places at the foot of Serra de Lavras Novas, December 1895, and (2) Schwacke 13856 from Chapada, Serra de Itatiaia, October, 1899, the former photographed by Macbride at Berlin as his type photograph number 10616. Ruhland (1903) says of the plant "Species foliorum consistentia longe ab omnibus affinis discrepans. Accedit glabrietas foliorum, eorumque forma, atque vaginae breves, ciliatae." The specific epithet is uppercased by Prain (1908).

Irwin and his associates describe the plant as a "rosette herb, the inflorescences ascending to 20 cm." and found it growing "in cerrado on outcrops, brejo, and gallery forest", at 1150 meters altitude. It has been collected in anthesis in March, October, and December. Silveira (1928) cites A. Silveira 411 from the Serra do Itatiaia, collected in 1910.

Citations: BRAZIL: Minas Gerais: Irwin, Fonsêca, Souza, Reis dos Santos, & Ramos 28565 (N, Z); Macedo 2760 (N, S, S); Maguire, Mendes Magalhães, & Maguire 49305 (N); Schwacke 12040 [Macbride photos 10616] (B--cotype, N--photo of cotype, N--photo of cotype, W--photo of cotype), 13856 (B--cotype).

[to be continued]